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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,820	03/31/2004	Raimund Strobel	1-17858	5052
68450 7590 01/29/2009 MARSHALL & MELHORN, LLC FOUR SEAGATE 8TH FLOOR TOLEDO, OH 43804				
EXAMINER				
CRUPEAU, JONATHAN				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
01/29/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/813,820

**Applicant(s)**

STROBEL ET AL.

**Examiner**

Jonathan Crepeau

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 12-28 is/are pending in the application.
- 4a) Of the above claim(s) 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-24 and 26-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/5508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 12-28. Claim 25 remains withdrawn from consideration. Claims 12-24 and 26-28 are newly rejected under 35 USC 103, and claims 22-24 are newly rejected under 35 USC 112 second paragraph, as necessitated by amendment. Accordingly, this action is made final.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 22-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 22 recites that "each of said microstructures includes at least one substructure." First, it is noted that "a substructure" has already been defined in claim 1. Further, the claim language encompasses the situation where the entire foil is covered with microstructures, and all of the microstructures on the foil contain a substructure. However, this configuration is expressly excluded by claim 1. Correction is required.

***Claim Rejections - 35 USC § 103***

4. Claims 12-24 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/82399 in view of Zhang et al (U.S. Pre-Grant Publication No. 2004/0033408).

WO '299 teaches a bipolar plate for a fuel cell. The plate is made of a conductive material (page 3, line 12) and is relatively thin so as to be a "foil." The plate comprises fluid conducting channels and electrical contact surfaces (lands), the lands comprising a plurality of contact-enhancing microstructures (see abstract). The channels are located between the lands, i.e., between at least two microstructures. The channels do not comprise the microstructures. The microstructures are integrated into the foil and are capable of "enhancing the rigidity of said foil" as recited in claims 12 and 26. Regarding claims 13 and 27, the microstructures have a polygonal cross-section (see Fig. 3). Regarding claim 15, although the reference does not appear to teach that the microstructures are made by an embossing or etching process, this claim is given little patentable weight since it does not limit the structure of the plate (see MPEP 2113). Regarding claims 16 and 28, the fluid conducting channels may be made by milling or engraving (i.e., etching) (see page 2, line 24). Regarding claim 17, the length of the microstructures is less than 400 microns (see page 4, line 1). Regarding claim 19, the reactant channels are capable of draining away condensed reaction products. Regarding claim 20, each of the microstructures includes a recessed center and forms a trough-like depression (see Fig. 3). Regarding claim 21, the foil is inherently hydrophobic.

The reference does not expressly teach that a substructure is superimposed above the microstructures, as recited in claims 12 and 26, or that the substructure includes a coating as recited in claims 22 and 24.

Zhang et al. teach a bipolar plate for fuel cells wherein the land areas contacting the electrodes are coated with a corrosion-resistant metal (see Fig. 2; par. [0010]).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to dispose the metal coating (corresponding to the claimed substructure) on the lands of the plate of WO '399. In [0008] and [0009], Zhang et al. teach that the objects of the invention are to "provide an improved bipolar plate which is simple and inexpensive to manufacture and which reliably maintains electrical conductivity and continuity of the surface during use in a fuel cell," and "to increase the durability and reliability of a fuel cell." As such, the artisan would be motivated to dispose the metal coating (corresponding to the claimed substructure) on the lands of the plate of WO '399. Thus, the substructure would be present "above" the microstructures on the lands of WO '399, as recited in claims 12 and 26. Further, regarding claim 22, each of the microstructures would include its own "substructure," which can be defined as the portion of the coating located above each microstructure.

Regarding claim 18, WO '399 further teaches an exemplary plate (foil) thickness of 3 mm on page 6, line 10. However, the reference does not expressly teach the claimed thickness of less than 0.5 mm. However, it is known that thinner plates/foils are advantageous from a standpoint of volume efficiency, and the artisan would therefore be motivated to use a thickness of about 0.5 mm or less in the foil of WO '399.

Regarding claim 23, which recites that the substructure has a length generally between 1 micron and 50 microns, it would be obvious to employ a coating (substructure) thickness within this range in the plate of WO '399 as modified by Zhang et al. One of the goals of the Zhang et

al. patent is to minimize coating material used while maximizing electrical conductivity between the bipolar plate and electrodes. Accordingly, it would be obvious to use a relatively thin coating of material, the thickness dimension corresponding to the "length" recited in claim 23.

Accordingly, Applicant's claimed range would be rendered obvious.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jonathan Crepeau/  
Primary Examiner, Art Unit 1795  
January 28, 2009